The Post-Covid-19 Pandemic Education Model Is Effective, Let's Compare: Online Versus Offline Learning

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Abstract— **Many variations of learning methods, ranging from discussions, dialogues, to simulations. When the COVID-19 pandemic began to emerge, learning models using information technology began to become a trend. Many media can be used as learning media such as the internet, mobile phones, and other platforms. The problem is that not all teachers and students understand the use of information technology. The solution offered is to create a model with the 3M concept (Methods, Media, and Materials) which will be the basis for educators and students to create balance and ease in the learning process. Method: To process the existing data, the identification concept will be used which is then made a hierarchical arrangement to facilitate the analysis of the results. The results were obtained in the form of several parameters that can be used as the basic for designing the 3M model (Method, Media, and Material).**

Keywords— Exploratory Analysis, Concepts, Learning

I. INTRODUCTION

Innovation in learning methods is currently growing rapidly. From schools into colleges, it seems as if they are metamorphosing to the current situation where the whole world is experiencing it, namely when the COVID-19 pandemic hit [1]. Many variations of learning methods currently running, from discussions, dialogues, to simulations. During this pandemic, learning models began to emerge using information technology. Many media can be used as learning media such as the internet, mobile phones, and other platforms. The problem is that not all teachers and students understand the use of technology [2]. The managers of information technology services began to be flooded with enthusiasts. Among them, giant companies such as Google have begun to develop their platforms. There are many examples of media platforms that provide services for students and the general public in learning such as Zoom, Webex, Teams, and so on. In India too, all learning models from elementary to tertiary levels have experienced difficulties and all face new challenges since the emergence of the COVID 19 pandemic [3]. Not only India but all over the world also feel the same in the field of Education [4]. To find out how the actual results of learning that turn into methods with all their information technology have an impact or not, it is necessary to do a benchmark against learning methods that are currently developing, namely using information technology. The purpose of this paper is to provide information on the level of effectiveness of online or offline learning from the perspective of the Method, Media, and Material attributes or abbreviated as 3M in online and offline learning models.

II. LITERATURE REVIEW

In a similar study, there was an attempt to address the necessary essence of online teaching and learning in the during COVID-19 pandemic and what kind of resources available from educational institutions could effectively turn formal education into online education with the help of virtual and other important online classes. tools in this ever-changing educational landscape [5].

Some studies use that use quantitative and qualitative approaches to study teacher and student perceptions of online teaching and learning modes and also highlight the process of implementing online teaching and learning modes. The value of the research is to describe a holistic picture of online teaching and learning activities that are taking place during the lockdown period including building linkages between the change management process and online teaching and learning processes in the education system in during COVID-19 outbreak to overcome these problems [6].

Subsequent research found that cost and time effectiveness, safety, convenience and increased participation were the most frequently cited positive aspects of an emergency online learning experience, while distraction and reduced focus, heavy workloads, problems with technology and the internet, and inadequate support from instructors and peers are the most recurring negative aspect [7].

Another research result is that it helps to design instructors and institutions to understand student attitudes about online learning in abnormal circumstances. Several recommendations informed by the interpretation of participant feedback are offered to help instructors, administrators, and policymakers improve the online learning experience going forward [8].

Another thing was conveyed differently in the study of the smart campus. Another panelist said that the success of universities in utilizing Information and Communication Technology (ICT) or often known as a smart campus as a competitive and worthy effort to compete essentially lies in

several indicators such as technology, information, organization and human [9].

The level of readiness of learning service media has not been fully maximized. A survey from the latest research in April 2020 shows that in developing countries the majority of teachers do online learning by giving assignments to students through several platforms such as WhatsApp in the early days of online learning obligations [10]. Another survey also reported that 58.8% of teachers surveyed admitted that they gave the same assignments to all students regardless of the socioeconomic and personal conditions of the students [11].

Taking into account some of the previous phenomena, it is very important and relevant for teachers and lecturers to equip themselves with the theory and principles of online learning before implementing it. Teachers and lecturers must continue to learn to improve their understanding and competence related to online learning with all its variants [12].

Therefore, this study found a concept of a way to measure and assess the level of effectiveness that will determine the readiness of learning after this pandemic ends, namely by measuring the 3M criteria (Methods, Media, and Materials).

III. METHOD & DISCUSSION

In the method and discussion section, the author divides it into 3 stages, namely, data collection, data analysis, and discussion of results.

A. Data Acquisition

The dataset used is the result of the acquisition taken randomly in each city in Central Java Province as a sample. In obtaining data, the author uses a technique called Accidental Sampling. This method is where the data will be retrieved according to the current state, meaning that if the conditions are appropriate, the data will be retrieved, otherwise it will be ignored. The method is simple which is taken using a google form with a variable number of 200 respondents who fill in. Here are the data obtained:

Table 3.1, School student respondent dataset

No.	Sex	Schools	Class	Program	System	Media	Online	Liked Method	Difficult Course	Course Criteria	Easy	Helpful	Effective
1	Man	SMA N 2 Purwokerto	10	IPA	Offline	Website	Youtube	Discussion	Physical	Non Exacta	Yes	Yes	No
2	Man	SMA N 2 Purwokerto	11	IPS	Offline	Website	Google Classroom	Discussion	Economy	Exacta	Yes	Yes	Yes
3	Man	SMA N 2 Purwokerto	12	IPS	Offline	Website	Youtube	Diskusi	Economy, Sociology	Exacta	Yes	Yes	Yes
...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	...
198	Woman	SMA N 2 Indramayu	11	IPA	Online	Website	MS Teams	Forum Assignment & Quiz	Physical	Exacta	Yes	Yes	Yes
199	Woman	SMA N 2 Indramayu	11	IPA	Online	Website	MS Teams	Forum Assignment & Quiz	Biology, Chemical, Language	Non Exacta	Yes	No	No
200	Woman	SMA N 2 Indramayu	10	IPA	Online	Website	MS Teams	Forum Assignment & Quiz	Math, Kimia, Physical, Histograph, Economy	Non Exacta	Yes	No	No

B. Data Analysis

In analyzing the data, the author uses Exploratory Data Analysis with the help of tools from Google Colab in processing it. Wherefrom the results of the data processing, the results obtained are the 6 intended results, namely:
1. The results of the comparison of the system used.
2. The results of the comparison of the preferred media types.
3. The results of the comparison of the types of platforms that are favorites and methods.
4. The results of the comparison of the level of effectiveness, convenience, and role of help.

In this discussion, it will be concluded from the results of plotting in data processing from Google Colab which will be concluded and then correlated with other results so that it becomes a complete conclusion that can provide information on whether this post-demic learning model is effective and can be followed by all schools, especially in Indonesia. Let's discuss one by one of the 6 intended results.

1. The results of the comparison of the system used.
   The results of the comparison of the system can be seen through Figure 3.1 below:
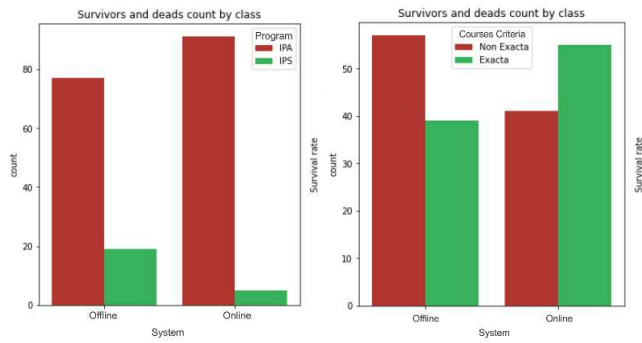
Figure 3.1, Comparison of the use of the system

In the results of comparisons seen from the use of the system, of the 200 data obtained are considered balanced, namely as much as 50% using online learning and 50% use offline learning. In the results based on majors, online learning is more dominated by students in the science department. This can be an evaluation material in terms of the Method in the Group of Social Sciences, whether in terms of material or media needs to be repaired.

For offline learning itself is considered less remembering the possibility is the same method given to students both majoring in science and IPS. Exacta criteria prefer online such as research that says that someone in studying exacta science does need high concentration and tend to individually [13].

2. The results of the comparison of the preferred media types.
   The results of the comparison of media types can be seen through the following figure 3.2:
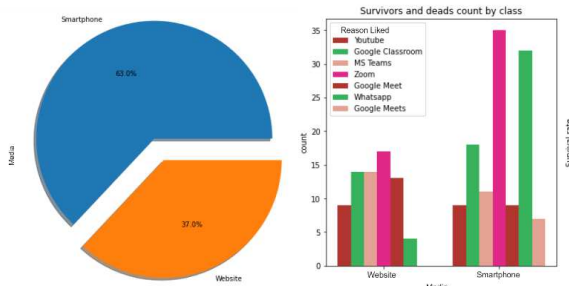

Figure 3.2, Comparison of the types of media used

In the comparison results seen from the use of the platform, of the 200 data obtained rated respondents prefer to use the smartphone platform. This is because the use of smartphones is more free and flexible. Besides that in learning can be everywhere so that the influence of the mood in learning is very important to help understand the learning material [14].

From the media used more using media zoom. For this case, the author cannot provide detailed information because it relates to the taste of the user, habits, and services from the media provider where services that provide convenience will always be in demand by users.

3. The results of the comparison of the types of platforms that are favorites and methods.
   The results of the comparison of platform types can be seen in Figure 3.3 below:
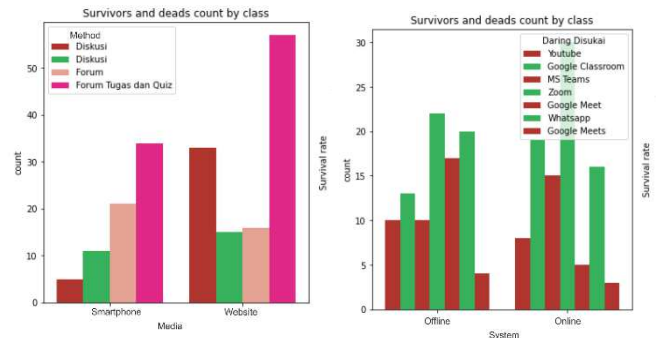

Figure 3.3, Comparison of the use of media platforms and methods

In the results of comparisons seen from the use of the method, of the 200 data obtained rated respondents prefer the forum and assignment methods. Slightly different if associated with discussion, discussions and forums have similarities, namely discussing the material simultaneously, only in the material subject. Discussions discussed 1 study while the forum could discuss the 1st study with the others with a more widespread study correlation. So that students will get easier to explore knowledge.

4. The results of the comparison of the level of effectiveness, convenience, and role of help.
   The results of the comparison of effectiveness, convenience, and the role of helping can be known through pictures 3.4 the following:
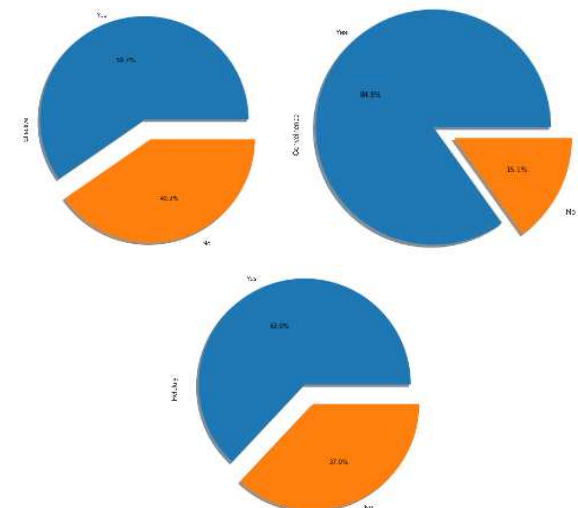

Figure 3.4, Comparison of effectiveness, convenience, and the role of assisting in learning

In Figure 3.4 it is a result of comparisons of the level of effectiveness assessed from 3 aspects, namely, material, media, and methods. First of the 65% material aspect state that online learning material is more effective and 35% stated less effective. Second of the 80% media aspect states that online media are more effective and 20% stated less effective. The third of the 65% method aspects stated effectively and 35% stated less effective.

However, online learning is still dominated by exacta science, meaning not thoroughly from different departments. The need for further analysis regarding the effectiveness of online learning for students to the end of this pandemic period [15].

The conclusion of the results in the analysis image is, for the level of effectiveness that using the online system is more dominant, 59.7% stated that it was effective, then in terms of convenience, 84.9% of the online system could provide convenience, and lastly, from the role side, it stated that 63% of the online system. can help work or in this case learning.

C. Discussion of Result

In the results of the previous analysis, the results that have been changed will be mapped in the percentage of the entire discussion, this is to see from the 3M side, namely Methods, Media, and Materials. Mapping results can be seen in table 3.2 below:

Table 3.2, the overall conclusion of the online versus offline exploratory learning system.

Comparative	Model	Value
System	Online	50%
	Offline	50%
Media	Website	37%
	Smartphone	63%
Platform	Zoom	50%
	Google	35%
	Youtube	10%
	etc.	5%
Class Program	IPA	70%
	IPS	30%
Criteria	Exacta	51,30%
	Non Exacta	48,70%
Method	Forum	70%
	Discussion	20%
	Assigment	10%
Effective	Yes	59,70%
	No	40,30%
Conveinence	Yes	84,90%
	No	15,10%

Helpful	Yes	63%
	No	37%

From table 3.2, a conclusion can be drawn that seeing the system has a balanced value, then users use smartphones more, and the most preferred method is forums, it can be ascertained that methods, media and materials are very influential on the course of this post-COVID 19 learning. To be able to maintain the effectiveness of learning after the COVID-19 pandemic, it is necessary to pay attention to the quality of the methods used, the media used and the material to be presented.

Seen in the table indeed seemed to be more enthusiasm for students who are enthusiastic about using online learning models. However, the analysis of the data carried out was only limited to a particular group, this made the writer take more data samples so that the analysis was deeper.

IV. CONCLUSION

Media is related to any platform that teachers can use to ensure online learning can work. After getting to know various alternative platforms or online learning media, what is no less important for educators to learn in the implementation of online learning is the method. This is related to how educators provide learning content effectively. Educators can formulate online learning strategies that are actually different from offline learning effectively. After that, educators must also move and accelerate their ability to find or even create digital teaching materials. At least good at digitizing previously manual material. The conclusion is that by applying the 3M criteria parameters, it will be easier to analyze the effectiveness of post-pandemic learning both online and offline. What can be concluded from 3M is that the most optimal method is to multiply forums, the most influential media is the use of smartphones because it is considered more flexible, and finally the most optimal material is on the exacta criteria because it is considered that many practical things can be done by piloting from digital media.

Suggestions for the future are to focus on modeling innovative learning styles so that they can help realize a roadmap for innovations called smart schools which may occur starting 4 or 5 years from this year where the COVID pandemic has not gone away. The new thing in the analysis carried out by the author is, the use of 3M parameters, namely material, media, and methods. This can make evidence that these parameters can be used in exploratory analysis of sustainable data. Given the new writer analyzes a little criteria listed in the referral table that has been served. In the future this analysis can be added with other criteria so that it can produce a more significant comparison to support the development of postpartums later.

that the authors can contribute to the idea of this concept. Hopefully, future research will make it easier to develop ideas, especially for the development of the field of educational technology.

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